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USE OF PRELIKON AT ZIGLER SHIPYARDS

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ABSTRACT

The objective of this paper is to demonstrate to its readers that it is possible for a shipyard, the size of Zigler, to maintain a small but an effective engineering group provided it is supported by a powerful tool like PRELIKON. Further, an inhouse engineering department in a shipyard reduces communication gaps between engineering and production, thus giving rise to increased productivity.

INTRODUCTION

The advent of computers is having and will continue to have a profound effect on the practice of Naval Architecture and the Art of Shipbuilding. The introduction of computers in general, as an aid to ship design in particular, has been widely accepted by the profession particularly in its simplest mode, as a sophisticated tool to perform routine tasks of a repetitive nature. Such applications are generally of immediate economic return, as they allow substantial reduction in manhours together with greater accuracy and thoroughness. Professor Horst Nowacki, in his paper, "Modern Approach to Integrated Ship Design," says, "The aspect of ship production must be treated as an integral part of ship design. The effects of production methods, time, and cost upon design decisions must be taken into careful consideration from the earliest design stage on. No artificial barriers must be permitted to exist between design and production decisions." I fully agree with Professor Nowacki's statement, and further believe, that this statement can be most effectively realized if the ship built by the shipyard is designed by its people too. At Zigler Shipyard, we do the complete design and engineering from the owner's requirements, with the aid of integrated computer programs called PRELIKON.

DISCUSSION

The Shipyard and Its Capabilities.

Zigler Shipyard, Division of Lee-Vac, Ltd. is situated on an 83 acre tract off the Mermentau River in Jennings, Louisiana. The shipyard was founded in 1913 fcr shipbuilding and repair as a Division of the G. B. Zigler Company, and started off building wooden barges. In 1967, the name of G. B. Zigler Company changed to Zigler Shipyard. Today, Zigler continues its knowledge and skills gained throughout its long period of operation with its commitment to utilize modern technology in its multi-phased construction efforts. Computer applications in the area of planning, scheduling, warehouse and material control, budgeting, and recently in the field of engineering, have contributed immensely to streamlining and making the shipyard more efficient-

The shipyard employs about 300 persons who build and repair barges, tugs, towboats, menhaden vessels, offshore supply vessels and seismographic vessels. Three years ago, the yard was building simple 150 ft. supply vessels for the Gulf of Mexico at the rate of three to four boats per year. Today, we are designing and building over 210 ft. offshore tug/supply vessels for North Sea operations, and delivering them at the rate of six to eight ships per year.

The Necessity For a System Such as PRELIKON.

Just a few years ago, the supply vessels that were built in the Gulf Coast Shipyards were small and simple, and were built mainly for use in the Gulf of Mexico. The owners of these vessels were easy to please, and there was plenty of work waiting for this new breed of vessels. The contract specifications for these vessels were thin, and the owners were happy as long as the overall dimensions of the vessel conformed to the specifications. As the supply vessels increased in nunber, the competition for work grew more keen. This prompted the owners and the operators to think *in* terms of required freight rate, and therefore, cargo deadweight.

The severe competition in the supply vessel business made the owners more demanding in the cargo carrying capacity, and the general performance of the vessel. Several owners and operators hired Naval Architects and Marine Engineers to write the specifications and act as owner's representatives. This transformed the contract specifications which formerly consisted of a few pages into a bound volume, with guarantees on deadweight, minimum deck cargo capacity, fuel capacity, speed and bollard pull. During the same period, a few supply vessels capsized while working the North Sea and other

rough waters. As a result, the classification societies and the United States Coast Guard imposed stiff statical stability requirements upon these vessels. The vessels for which no cross curves were prepared before, now had to be analyzed taking into account the effect of trim at various angles of heels. In the near future, cross curves will have to be prepared taking into account the effect of waves at various positions. All these events gave a small shipbuilder a clear choice of having its own inhouse design and engineering department or using the services of a design agent. The management at Zigler Shipyard decided to have its own design department rather than work at the leisure of an outside design agent.

At Zigler, the engineering staff comprises seven people, four of which are draftsmen. Without the aid of a system such as PRELIKON, which was made available to Zigler Shipyard in April, 1975, through the Maritime Administration, it would be very difficult, tedious and time consuming if one attempted to design a ship and analyze the hull as required.

However, with the aid of PRELIKON, we have designed one ship, and analyzed four other ships that were already in progress, and we are currently working on the design of a 300 ft. ocean going vessel. A small shipyard can have its own effective design and engineering department, maintaining total independence, provided it is backed by a powerful tool such as PRELIKON.

PRELIKON and Its Capabilities.

The PRELIKON system was developed jointly by Bergen Shipyard of the Aker Group and Det Norske Veritas in Norway. The system was released in 1970. The Maritime Administration (U. S. Department of Commerce) purchased PRELIKON as a part of AUTOKON-71 system in 1973. Realizing that the greater segment of the potential users of PRELIKON were not necessarily potential AUTOKON users, MarAd negotiated with SRS to free PRELIKON from proprietary status, thus making it available to all parties in the United States without restriction.

PRELIKON system consists of a number of applications programs covering a major part of the total design spiral. PRELIKON has its own central data base through which the various program modules communicate. New hull forms may be generated from scratch by reading in offsets or by systematic distortion of a previously designed hull.

The PRELIKON system is divided into three logical groups as follows:

The Input Modules:	Define the Hull Form
The Working Modules:	Perform the Calculations and Prepare the Output
The Service Modules:	Perform Mainly the Data Utility Functions

The Input Modules Consist of:

BV101 : The Main HULL DEFINITION Module

BV102 : The LINK AUTOKON-PRELIKON Module

BV105 : The HULL VARIATION Module

The Working Modules Consist of:

BV11O: The HYDROSTATIC Module

Bv125: The LOAD AND BALANCING Module

BV130: The RESISTANCE Module

NV208/NV209C: The BONJEAN Module

NV210/NV212c: The TRANSVERSE STABILITY Module

NV215 : The FLOODABLE LENGTH Module

NV220 : The LAUNCHING Module

NV241/NV242C : The TRIM TABLE Module

NV251/NV252: The CAPACITY ULLAGE & SOUNDING Module

NV253: The COMPARTMENT DATA Module

NV260 : The LONGITUDINAL STRENGTH Module

The Service Modules Consist of:

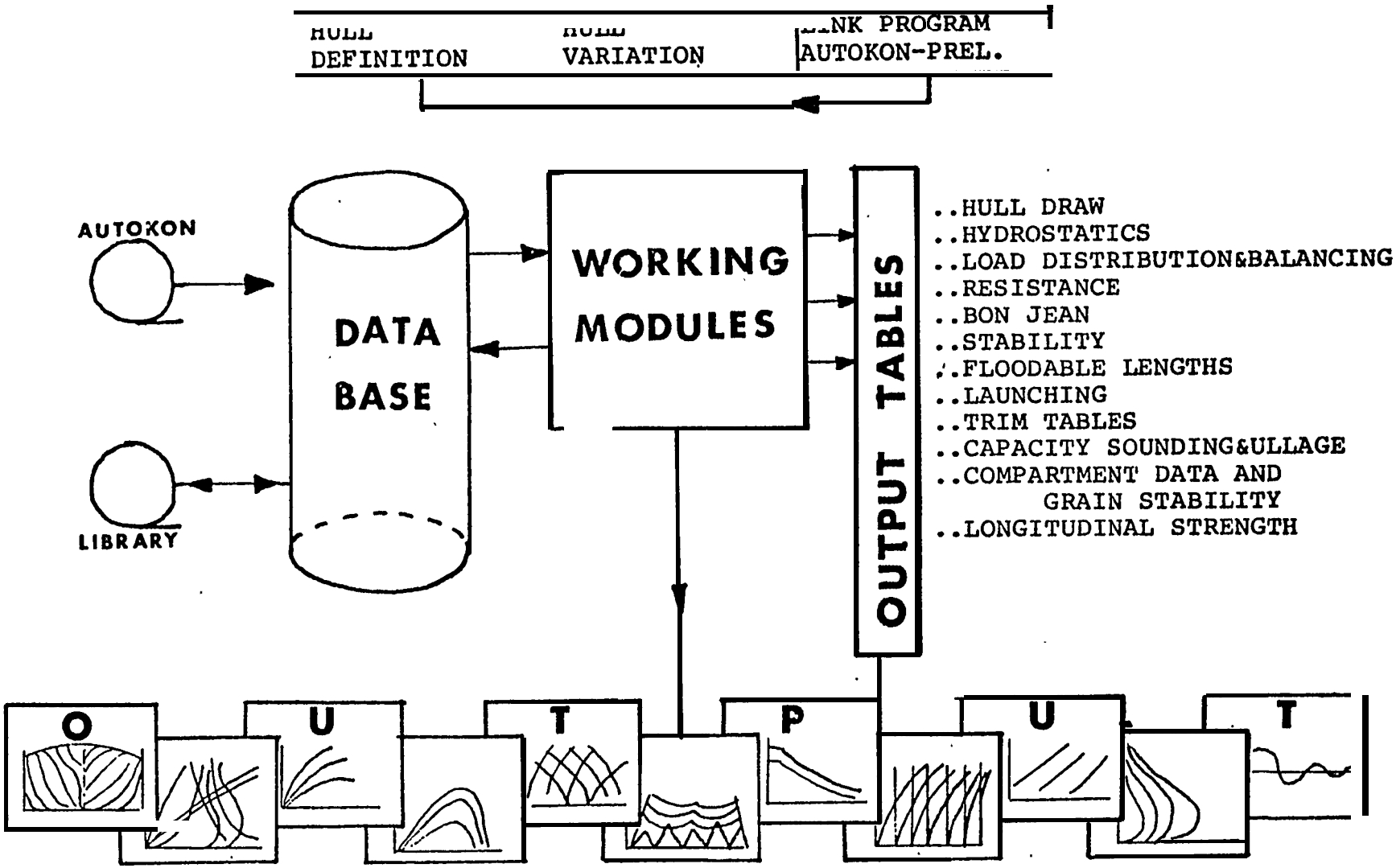
NV202 : **The** TAPE STORAGE & RETRIEVAL Module

NV270 : **The** HULL DATA TRANSFORMATION Module

SR500: The DATA BASE UTILITY Module

A general description of each of the modules is given in Appendix A of the paper "PRELIKON CAPABILITIES" presented at the REAPS meeting, June 26, 1974, by Mr. Svein Hansen of SRS.

PRELIKON


DEFINITION
VARIATION
AUTOKON-PREL.
AUTOKON
LIBRARY
DATA BASE
WORKING MODULES
OUTPUT TABLES
..HULL DRAW
..HYDROSTATICS
..LOAD DISTRIBUTION&BALANCING
..RESISTANCE
..BON JEAN
..STABILITY
..FLOODABLE LENGTHS
..LAUNCHING
..TRIM TABLES
..CAPACITY SOUNDING&ULLAGE
..COMPARTMENT DATA AND GRAIN STABILITY
..LONGITUDINAL STRENGTH
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CONCLUSION

Computer applications in shipbuilding are here to stay. Just as Zigler Shipyard has taken advantage of PRELIKON, several other small shipyards can take similar advantage and maintain total independence by having their own design and engineering staff. An inhouse engineering department in a shipyard designs with the particular shipyard practices and constraints in mind. This reduces the communication gap between engineering and production which results in increased productivity.

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